# SECTION 4. LANDSCAPE AND SITE DEVELOPMENT STANDARDS

## 4.1 INTRODUCTION

The primary strategy to landscape planning and development at Mountain Home AFB is to provide design in support of a self-sufficient, water-conserving, and non-toxic environment. This approach will lead to cost savings, greater health and vigor of plant materials, and improved quality of life.

One of the most often overlooked elements of landscape planning is the maintenance requirement after construction. Careful consideration should be given to plant selection, site preparation, and other landscape specifications, which ultimately define how landscapes will be maintained.

This document should serve as a guide, and is not intended to preclude creative solutions to a given landscape problem. However, deviations should be approved by the base landscape architect prior to implementation.

For general landscape design principles for Air Force installations, reference the Air Force Landscape Design Guide at http://www.afcee.brooks.af.mil/dc/dcd/land/index.mil

Landscape installation and maintenance methods should conform to industry standards. Reference to these criteria can be found in the Landscape Specification Guidelines, prepared by the Landscape Contractor's Association.

An important reference for selection and approval of nursery stock is the ANSI Z-60, American Industry Standards for Nursery Stock, 1996 (or current issue).

## 4.2 LANDSCAPE GOALS AND OBJECTIVES

### 4.2.1 General

The perceived image of Mountain Home AFB and its mission pertaining to landscape management should be one of efficiency, conservation, and environmental quality. An installation's landscape can be a significant factor in creating a positive Base perception, as well as contributing to overall morale and quality of life for the community. A landscape design process that includes conscientious site analysis, site design, plant selection, and site detailing should be employed to achieve the desired goals and objectives.

The General Plan (1998) for Mountain Home AFB makes several recommendations for future landscape development. The plan specifies the use of Xeriscape techniques and indigenous plants in reducing water consumption and landscape maintenance costs.

The Landscape Assistance Team Report (1997) also provides recommendations for reducing water and maintenance requirements. In addition, the report includes minimizing herbicide and pesticide use, and improving the visual and environmental quality of the Base, as landscape goals.

The following are key objectives for landscape design and maintenance. These objectives should be the primary focus in any decision making process.

#### 4.2.2 Objectives for Water Conservation:

- Conversion of high water consumptive landscapes to water conserving designs that require only occasional irrigation after establishment.
- Use primarily drought tolerant plant materials.
- Replace existing irrigation systems that no longer function properly.
- Minimize turf areas to only the most important and visible locations. Design turf areas in shallow depressions where possible to passively retain water.
- Implement turf management practices to provide an optimum environment for growth. This would include soil enhancement through appropriate fertilization, mulching, thatching, aeration, over-seeding, and weed control.
- Replace existing turf in designated locations with grass species that have reduced water requirements. Designated locations will be as defined by base landscape assessment.

#### 4.2.3 Objectives for Reduced Landscape Maintenance Costs:

- Automate manually operated irrigation systems.
- Convert existing turf areas to landscapes requiring less maintenance.
- Develop a herbicide program for control of weeds in place of existing mechanical/manual methods.
- Implement turf management practices to provide an optimum environment for growth. This would include soil enhancement through appropriate fertilization, mulching, thatching, aeration, over-seeding, and weed control.

#### 4.2.4 Objectives for Enhancing Quality of Life:

- Use landscaping to modify microclimate, i.e. windbreaks, trees for shade, plant barriers for noise reduction, ground covers to control dust movement, etc.
- Use landscaping to enhance the appearance of buildings, entries, and circulation paths.
- Use landscaping to screen objectionable views such as parking lots, dumpster bins, utilities, etc.

- Use landscaping to define space and circulation along streets, sidewalks, and pathways.

## 4.3 LANDSCAPE DEVELOPMENT AREAS

### 4.3.1 Improved

These are the most intensely developed and maintained locations of the base. They include the grounds of most facilities, parks, street shoulders, and planting beds. Irrigation systems and regular maintenance are generally required. Design focus in future development of improved areas should be to minimize maintenance requirements, water conservation, and base beautification. Some development not meeting objectives of water conservation and reduced maintenance will continue, but shall be concentrated to those locations of high visibility and areas requiring a more formal landscape.

### 4.3.2 Semi-Improved

Semi-improved areas generally include open fields within the base requiring only infrequent mowing and litter control. Design focus for future development should be continued minimal maintenance. Efforts should be made to maintain vegetative cover with few weeds in semi-improved sites, which aids significantly in reducing wind blown dust. Restoration of these areas to native grass and shrub communities is highly encouraged. Rodent control may be required if adjacent to improved facilities.

### 4.3.3 Unimproved

Natural, no maintenance required. Some effort should be made to retain native vegetative communities. Where fire or other disruptive occurrence has weakened native vegetation, rehabilitation is encouraged.

## 4.4 LANDSCAPE DESIGN CRITERIA

### 4.4.1 Xeriscape and Permaculture

Xeriscape is a term coined by the Denver Water Department in 1980 referring to water-efficient landscaping and is not to be confused with cactus and gravel gardening, which is sometimes called zero-scaping. Typical irrigation demand can be easily reduced by as much as 50% using Xeriscape techniques. Permaculture refers to the exclusive use of native plant materials in landscape design. Once established, permaculture landscapes can be expected to be maintained with little assisted irrigation. As a result of the dry climate, wind, and water storage limitations at Mountain Home AFB, Xeriscape and permaculture principles should be carefully considered in any landscape design. Practices to apply are:

- Limiting irrigated turf areas and using drought tolerant grass mixtures.

- Use appropriate plant materials for dry climates, grouping plants together in accordance with their water requirements.
- Improve soil condition by composting to improve water retention and fertility.
- Use organic mulches to hold water and reduce weed growth.
- Irrigate efficiently by using adequate system design.

#### 4.4.2 Topsoil and Amendments

Soil tests should be performed at all new project sites to determine the composition of surface soil, top 150-200 mm (6-8 in), pH, organic content, and available nitrogen, phosphorus, and potassium. Amending of topsoil will generally include addition of organic matter, nitrogen, and sulfur or gypsum to lower pH.

For dryland seeded areas, existing surface soil removed from the site, stockpiled, and replaced in areas that were disturbed may be acceptable. Where budgets permit, incorporate 2.3 cubic meters (3 cubic yards) of organic matter per 9.2 square meters (1000 square feet) into the top 100 mm (4 in) of soil prior to seeding.

Topsoil provided from off-site shall be a sandy loam as described by the USDA textural class and shall have a maximum particle size of 19 mm (¾ in) with a maximum of 3 percent retained on a 6.25 mm (¼ in) mesh screen and a minimum of 5 percent passing through a 120-mesh screen. Topsoil shall contain 5-20% organic matter. Topsoil shall be obtained from well-drained areas and shall not contain more than 5 percent water by volume. Topsoil shall be free of debris, noxious weeds, toxic substances, or any other material that may be harmful to plant growth. The pH shall be between 6.5 and 7.0, soluble salts shall not exceed 4 mmhos/cm (600ppm).

#### 4.4.3 Organic and Inorganic Mulches

Organic mulch, consisting of a coarse grade shredded or ground bark, shall be applied to a depth of 75-100 mm (3 to 4 in) within the root zones of all plant materials to maintain soil moisture, reduce soil temperature, reduce weeds, prevent mechanical damage, reduce soil compaction, and prevent erosion. Organic mulches add organic matter to the soil as decomposition occurs. No weed barrier shall be used under organic mulches.

Mycorrhizal fungi shall be added to the upper half of backfill in tree plantings to enhance root growth and aid in plant establishment.

Use weed barrier fabric, rather than black polyethylene (plastic) within planting beds. Plastic sheeting reduces air and moisture movement in the upper soil levels, and alters the beneficial fungi population in the soil that assist to establish healthy plants. It is acceptable to use the plastic sheeting (6-10 mil polyethylene) in conjunction with river rock (i.e. road shoulders) or other locations where water percolation is not desired.

Limit the use of lava (volcanic) rock. Do not use as a mulch for plants. Lava rock absorbs heat, which is then reflected back to the plant roots and foliage. Lava rocks also absorb water reducing soil moisture and water available to plant roots.

River rock mulch use may be limited to primary vehicular routes and VIP areas. River rock mulches (to 63 mm size (2½ in)) have been used extensively on base which adds to the reflective heating affect. Permeable weed barrier fabric shall be placed under rock unless polyethylene is specified. Reuse of existing river rock within a project site may be allowed only if it is pressure washed and sifted to minimize weed problems.

Where plant materials are specified in rock mulch areas, organic mulch shall be applied around the root zones, as described above, and edging provided to separate different mulch materials. See also, paragraph 4.4.6 below regarding edging materials. Construction projects excavating in rock shoulder areas shall remove rock and weed barrier prior to digging and replace with new materials or equivalent.

Carwash picture

#### 4.4.4 Irrigation

As previously stated as a landscape objective, it is essential that strong consideration be given to minimizing irrigated turf areas. Design specifying turf should be concentrated to those locations of high visibility, areas needing a more formal appearance, or for quality of life criteria.

Select and maintain similar grass varieties suited to appropriate development zones. Design larger turf areas in shallow depressions to passively collect rainwater where feasible. Also use these areas for tree and shrub plantings. Provide quality irrigation design for tree, shrub, and groundcover areas. Rigid pipe is preferred over polyethylene tubing due to maintenance concerns. For facilitating visual inspection of the irrigation system, multi-outlet emitters or bubblers places on fixed risers are preferred in lieu of providing numerous emitters on emitter line buried under mulch. In addition, "blowing down" emitter lines to winterize causes significantly more repair problems than rigid pipe. Create drainage patterns within each project site to capture and utilize runoff.

Mountain Home AFB encourages compliance with the installation watering schedule limiting irrigation of plants to certain hours of the day. Due to high temperature, humidity levels and wind conditions in the summer months, irrigating during mid-day should be infrequent. Controllers should be programmed primarily to apply the correct amount of water at night and early in the morning.

Sprinkler head layout and design should provide sufficient overlap to compensate for wind. Overlap beyond 50% (head to head) is recommended for exposed locations. Contracts shall provide for a one-year warranty on irrigation equipment and operation.

#### 4.4.5 Landscape Elements

Use drought resistant turf and plant varieties, and/or those indigenous or well adapted to local conditions. Use of native species is encouraged wherever possible. See PLANTLIST (MHAFBplants.doc) for acceptable plant and turf species.

Plant material selection should provide for variety and year-round interest. To enhance the attractiveness of design use a mixture of plants which vary in height, color, texture, and seasonal characteristics. Avoid symmetry, use an informal arrangement for appearance and ease of maintenance. Do not use plants that drop a large amount of fruit.

Shrubs should be planted a minimum of .9 m (3 ft) away from buildings, small trees at least 10 ft (3 m) away, and larger trees at least 6.1 m (20 ft) unless it is of specific architectural intent, i.e. to screen, provide scale, etc. Location of plantings and other features within 9.1 m (30 ft) of inhabited facilities shall comply with DOD force protection measures. Design of site improvements such as fencing, berms, planters, bollards, and landscaping shall consider applicability to force protection and mitigating effects of potential threat.

Use berms to screen and provide interest. Berms should be limited to no steeper than 1:5 slope to allow retention of bark and mulch.

Existing trees and shrubs are to be preserved in accordance with industry standards where specified. These protection measures shall include fencing outside the drip line, watering, fertilization, pruning, etc. to maintain in optimum condition.

Newly planted trees should not be pruned, except to remove dead, broken, or crossing branches. Trees should not be topped or the leader pruned. All work should be performed by a certified arborist.

Trees should not be staked unless the prevailing wind will not allow for establishment. If a tree requires staking, performance of work shall conform to industry standards.

If a project requires the removal of trees, ensure that any sale or use of the wood conforms to AFR 126-1.

#### 4.4.6 Lawn and Plant Material Edging

Lawn edging separates lawn areas from shrub planting areas. Wood edging shall not be used. A 150 mm (6-in) wide by 300 mm (12-in) deep concrete curb or mow edge, reinforced with #4 bars top and bottom, shall be used where appearance and durability are a high priority and where budgets permit. For standard concrete mow edge, see MOWEDGE detail (mowedge.jpg).

An alternate design using a machine made curb-type concrete edging is also acceptable. For curb-type concrete mow edge, see CURBMOWEDGE (curbmowedge.jpg).

Appropriate separation between differing mulch materials around plantings may include steel and plastic edging, as well as the concrete, see paragraph 4.4.3.

Lawn surface shall be flush with top elevation of concrete mow edge in order to be functional. For proper containment, finished grades of mulch materials shall be approximately 25 mm (1in) below top elevation of concrete, steel, or plastic edging.

#### 4.4.7 Maintenance and Warranty

A minimum 120 day establishment period shall be provided for all landscape projects. All plant material and installed irrigation systems shall be included under warranty for a minimum 12 month period.

#### 4.4.8 Windbreaks

Hot and cold climate extremes are characteristic weather conditions at Mountain Home AFB, however wind is a prevailing factor. Controlling both summer and winter wind through windbreaks can effect improvement in livability and energy efficiency. Windbreaks also serve to reduce dust, noise, erosion, and provides habitat for wildlife.

Past examples of windbreak design exist on base. Many of the windbreaks were planted through a cooperative effort with the US Department of Agriculture, Natural Resources Conservation Service Plant Materials Center in Aberdeen Idaho. The windbreaks generally include three to five rows of plants with approximately 3.6-6.0 m (12-20 ft) between rows. Windbreaks are setback a minimum of 15.2 m (50 ft) from fences, 24.3 m (80 ft) from residences, and 30.4 m (100 ft) from other buildings. Plant species used in the past include Siberian Peashrub, Rocky Mountain Juniper, Hybrid Poplar, Green Ash, Austrian Pine, Lilac, Shubert Chokecherry, and Honeysuckle.

Evergreen trees should be planted 1.8 m (6 ft) on center. Deciduous trees should be planted 3.0 m (10 ft) on center, and deciduous shrubs should be planted 1.5 m (5 ft) on center. Planting windbreaks on slightly raised berms is highly encouraged to increase elevation of trees and relieves flatness of the area. Weed barrier fabric should be placed at the base of each row of plants and drip irrigation provided during establishment.

Windbreaks should be planted to provide functional results within five years.

#### 4.4.9 Reduction of Foreign Object Debris (FOD)

Landscape projects which are located adjacent to the base flight line, runways, taxiways, or aircraft parking areas, shall consider critical design criteria to reduce foreign object debris or FOD. No deciduous plant materials shall be allowed on the flight line side of the security wall. Mulch materials shall be selected for stability, so as not to become airborne during high winds. Organic mulches shall not be used along the flight line. Plant materials, such as tall grasses and fruit-bearing trees and shrubs that are attractive to birds, shall be avoided.

## 4.5 EXTERIOR SIGNAGE

Main design concept on exterior signage is to limit the number of signs. Provide directional signs only for high traffic areas. Also the size of the sign should be kept at a minimum. The standard for readability is 2.54 mm (1 inch) of letter height for each 7.6 m (25 ft) of view distance.

All exterior signage shall comply with ACC Standards which are found in the document ACCR 88-1 and Air Force Pamphlet 32-1097 (supercedes AFP 88-40).

General description of the ACCR 88-1 Standards are as follows:

- Limit number of signs to the minimum required for identification and customer service.
- For signage attached to buildings, see Architectural Standards Section of this design guide.
- Except where controlled by National Standards applicable to the United States Air Force (i.e., traffic control, OSHA safety signs) exterior signs shall have white letters on brown background and brown posts.
- Sign stock and hardware shall be typically aluminum or galvanized steel.
- Building identification - one sign per building except for customer service facilities. Limit information to street address number as much as possible.
- Exterior signs limited to four sign types. B1, B2, B3, B4. Refer to ACCR 88-1 for details.

## 4.6 FENCING/SCREENS

Main design concept governing the use of fencing or screens is to use a low maintenance material that either matches an adjacent building facade material or matches the following standards for the building zone.

- Industrial/Flight Line Split face concrete masonry unit.
- Residential (single family) – Vertical cedar fencing.
- Community/Administrative - Split face concrete masonry unit.

Specific design considerations are as follows:

- Orient openings into screened area away from main circulation path if possible.

- If split face masonry is not in budget use metal screening.

- Use wrought-iron gate for openings into screened areas.

- Items to be screened should include outside mechanical/electrical units, dumpster areas, and recycle bins. For dimensions of a single dumpster screen, see Civil Engineering Standards.

## 4.7 SITE LIGHTING

The main design concept governing site lighting is to use low maintenance materials which have clean, simple designs and which are available from local sources.

Specific design requirements are as follows:

- In parking or general lighting areas the design shall be dark bronze aluminum poles (on pedestals where appropriate) with a rectangular light fixture (, High Pressure Sodium.)

- Bollard lighting shall be used to enhance high traffic areas (i.e., administrative building entrances, dormitories) and shall be made of concrete.

- Lighting in residential areas shall be as described in the Electrical Standards, Exterior Lighting Section.

- Height of fixture for parking is generally 7.6 m (25 ft) to 10.6 m (35 ft). Height for pedestrian walkways shall be 4.4 m (14 ft 6 in) to 4.6 m (15 ft 0 in).

## 4.8 SITE FURNISHINGS AND PLAY EQUIPMENT

The concept for site furnishings is to have a very durable material, which has a similar texture or finish throughout the different types of furnishings.

Where possible metal and concrete shall be used as the primary materials. A dark bronze color shall be used when metals are used for the materials.

Playgrounds shall be in full accordance with Consumer Products Safety Commission and ASTMs for playground equipment and surfacing. The playground design shall be officially reviewed and approved by a certified National Playground Safety Inspector (NPSI) and that the installation of the playground have a final inspection by a certified NPSI. The playground equipment shall comply with ASTM is F 1487-98 and the playground surfacing with ASTM F 1292. The new handicap accessibility standard is ASTM F 1951 (previously ASTM PS 83). Equipment for the playground shall be certifies by the International Play Equipment Manufacturers Association (IPEMA). Consult the ACC Playground Brochure for further information on design, appropriate

equipment and equipment suited to local climate. Wood playground equipment shall not be used.